

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

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TO: Gene Hall, Project Manager
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SUBJECT: Albion Sheridan Township Landfill, Draft Phase I Summary, June 1993

Page 1-1 section 1.2 states "Purpose and scope" "The purpose of the Phase One Summary Report is to provide a basis for decisions regarding the RI activities at the site Specifically the report provides the basis for:

- * Determining if a Phase II investigation is necessary in order to complete the FS and Risk Assessment;
- * Determining the scope of work for the Phase II Investigation if it is needed; and
- * Determining if an interim remedy should be pursued prior to completing the RI/FS.

The first point listed above needs to be addressed in the context of the current and future risk associated with this site.

- * There is direct evidence that a plume of leachate impacted groundwater is leaving the landfill site and discharging into the regional bedrock drinking water supply.
- * Any existing sources of concentrated waste left in the landfill constitute a current and future risk to the drinking water supplies in this regional aquifer system.
- * There is geological, hydrogeological and geochemical confirmation that leachate from the southern end of the land fill discharges directly into the bedrock aquifer which serves as a regional drinking water supply.
- * Additional site specific work will be necessary to be certain that the regional drinking water supplies are not currently, or in the future, at risk as a result of the leachate plume entering the bedrock aquifer system.

An analyses of the groundwater flow patterns in the weathered bedrock (Draft Phase I Summary Report figures 41-43) and flow patterns in the shallow bed rock (figures 43-46) reveal that there is a very flat gradient in these units at the southern end of the land fill. The significance of a flat groundwater gradient in a highly permeable rock or aquifer is that it delineates a zone of groundwater recharge. The geological cross sections (figures 25-27) show the relationship between the glacial drift and the fractured bed rock. Figure 26 defines a bedrock high located under MW04 which is in contact with the southern end of the land fill. This bedrock high coincides with the groundwater gradient data indicating that a zone or recharge to the aquifer is likely present. The geochemical data (Specific conductance isoconcentrations maps) confirm that a substantial portion groundwater from the southern end of the plume is entering the bedrock aquifer system. I have approached this analyses first from the hydrogeology and geological conditions of the site. The geochemical monitoring results from groundwater sampling indicates that the ground water recharging the bedrock at this location is leachate impacted groundwater from the landfill. Figures 47-50 show the specific conductance plume moving into the regional bedrock aquifer system.

The current configuration of monitoring wells sufficiently demonstrates that a substantial portion of the groundwater passing through the land fill recharges the bedrock aquifer system and travels deeper into the aquifer. The groundwater at the southern end of the land fill is not discharging to the Kalamazoo River as would be expected. It is diving deeper in to the fractured bed rock where it may eventually be drawn into the pumping cones of large industries, municipal water supplies, or bedrock residential water supplies. This occurs in this area due to the site specific hydrogeological conditions. Additional work to further define the site specific risks associated with this site is necessary because the groundwater that was initially expected to be discharging to the Kalamazoo River has now been found to be discharging into the regional drinking water supply system.

Contaminant flow in fractured bedrock in contact with recharge from a landfill may present some complex contaminant transport and flow problems. Additional analyses of existing data, further characterization of the waste mass, and a better understanding of the hydrogeology/contaminant transport mechanisms is required to properly assess the risk to public health and the environment as a result of this landfill. Any waste mass that is currently leaching quantities of contamination at this site poses an existing and future risk to wells drawing water from this regional aquifer system. Drums that are in a partial state of decay and those not yet leaking are also a continuous and future threat to the drinking water supplies in the area. Additional geophysical exploration for buried drums or other potential sources must be undertaken so that the risk of loosing substantial quantities of organic contaminants to the aquifer system can be prevented.

Additional analyses of the site specific data and sampling results obtained from the round two sampling results will help to further define the risks associated with this site. My unit needs additional time to prepare a full hydrogeological, geochemical and geophysical assessment of the conditions at this site to provide guidance on what should be done to further investigate the site. The additional efforts should be targeted toward protection of the regional aquifer system from current and future leachate contamination from this land fill.

James R. Heinzen